

PUERTO RICAN HOLOPODOPEs

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The name **Holopodopes** (plural of holopod-ops) is proposed here for an infraorder of the suborder Sigmurethra, to include the achatinoids (Achatinidae and Spiraxidae), Streptaxidae, rhytidoids (Acavidae proper + Caryodinae, Haplotrematidae, Rhytididae and Chlamydephoridae) and orthalicoids (Urocopidae and Orthalicidae or Bulimulidae). In a systematic arrangement, they should precede the Aulacopoda (arionoids, limacoids and testacelloids) and the restricted Holopoda (polygyroids, oleacinoids and helicoids). Some of the reasons for the separation of the holopodopes have been outlined in an earlier paper (1955).

The symbols used for Puerto Rican localities were explained recently (1961).

Opeas pumilum (Pfeiffer). Es2 (coconut plantation).

The older name, *Helix hannensis* Rang, 1831, from West Africa, which may have been this species, now can be dropped as obsolete. The other widely distributed *Opeas*, *O. pyrgula* Schmacker & Boettger, which has less arcuate growth striae, probably also occurs in Puerto Rico, although it has not been reported, unless the older, but obsolete name, *Stenogyra alabastrina* Shuttleworth, from near San Juan, represented it. The more typical Ferussaciinae, *Ceciloides* (*Geostilbia*) *aperta* (Swainson) + *gundlachi* (Pfeiffer) and *C. (Karolus) consobrinus* (Orbigny), found by van der Schalie, 1948:50, 51, also have been distributed widely by commerce.

Lamellaxis (*Leptopeas*?) *micra* (Orbigny) and var. *margaritaceus* (Shuttleworth). Es2 (coconuts), Pn1 (yams), Wr2 (coffee), Wr3. All my dry shells (more in alcohol) nearer the smoother form, which is not limited to Puerto Rico; the obsolete name, *Stenogyra gompharium* Shuttleworth, from near San Juan, may have been based on the typical one.

Martens, 1877:345, reported the Cuban *L. (Leptopeas) paludinoidea* (Orbigny) from Aguadilla (Ww), but I got neither it nor the ubiquitous *L. (Allopeas) gracilis* (Hutton), which may mean they are more limited to cultivated areas.

Lamellaxis (s. s.) *monodon* (C. B. Adams) and var. *opalescens* (Shuttleworth). Pn1, Pr3, Wr2, Wn; my only dry shell (Wr2) the imperforate form, which also occurs in Jamaica.

Obeliscus (Stenogyra) terebraster (Lamarck). Deep in humus, Er3, 5, Pr1-4, 6, Wr2, 3, 1800-4000 ft.; typical larger form.

O. (S.) TEREBRASTER RARISINISTER, new subspecies. En1, Es3, 4, Jn1 (type locality), Pn1; lowland form smaller throughout, not simply with less whorls. The type, Pilsbry, 1906 (16a):pl. 32, fig. 31, a sinistral shell (ANSP. 59320 from R. Swift) of this variety. It measures: 14.4 mm. by 28 (4.1 mm.) with 10½ whorls.

O. (S.) swiftianus (Pfeiffer). Ps2 (attains length of 10.5 mm., with 8.2 whorls) & Ws (smaller); this species has gone around the world.

O. (Pseudobalea) hasta (Pfeiffer). Under leaves on ground and in moss on tree trunks; Er2, Jn1, Pn, Pr3, 6, Wr, 100-3400 ft.

Since *Balea dominicensis* Pfr., 1853, from "I. Haiti," is identifiable only from its inclusion by Pfeiffer himself in the synonymy of *O. hasta*, the slightly older name is clearly obsolete, even if dated from Pilsbry, 1906 (16a):272.

Subulina octona (Bruguière). On ground under dead leaves; Ee, En, Es2-4, Jn, Js, Pn, Pr2, 3, Ps, Wn, Wr1, Ws, Ww; 0-3400 ft.

The obsolete *Stenogyra (Subulina) acicularis* Shuttleworth, based on one shell from near Fajardo, seems to be represented in some eastern lots (Ee, Es2) from near the seashore by occasional dwarfed shells (with fewer whorls, but sexually mature) which have more deeply etched, growth striae, that do crenulate the sutures.

Leptinaria unilamellata (Orbigny). Widely reported by van der Schalie, 1948:56, probably from cultivated places.

Very unfortunately, I, 1945:91, adopted Orbigny's prior name before the more widely used *L. lamellata* (Potiez & Michaud) would have been saved by the 50 year "rule." Recently, Aguayo, 1961:94, added the other, equally ubiquitous, but more terrestrial *L?* (*Beckianum*) *beckianum* (Pfeiffer), which already was known from both the Virgins and Haiti.

Austroselenites (Zophos) alticola H. B. Baker. Deep in leaf humus, Er2-4, and probably Er1 and 5 (too young for exact identification); certainly above 2500 ft. on El Yunque and probably Luquillo Mts. above 2000.

A. (Z.) concolor (Férussac). Also terrestrial, En 3, 4, Jn, Pn, Pr1, 3, 4, Wr3, and probably Pr 2, 6, Wn, Wr2 (too young); certainly on lowlands, and apparently represented by a smaller, darker race up to 4000 ft. in the Cordillera Central, but my material is too scanty for certainty.

The widely transported streptaxid, *Diaphera (Huttonella)*

bicolor (Hutton) was found by van der Schalie, 1948:68. *Diaphera* Albers, 1850, of which *Diaphora* Albers-Martens, 1860, is a homonymic emendation, is prior to *Gulella* Pfr., 1856, and *D. bicolor* is the type (Nevill, 1878) of *Huttonella* Pfr., also 1856, of which *Indoennea* Kobelt, 1904, is a subjective synonym.

Brachypodella (*s. s.*) *riisei* (Pfeiffer). Lowlands, En, Jn, Pn, Wn, Ws.

B. (s. s.) pallida ("Pfeiffer" Philippi). Lowlands, En, Jn; Ps2 (*beattyi*); Ws (approaching *beattyi*).

B. (Brevipedella) portoricana (Pfeiffer). En, Jn, Pn, Wn, Wr2, 0-2300 ft.

These 3 species of *Brachypodella* may occur within a few feet of each other on limestone rocks, but *B. portoricana*, much the poorest climber, was the only one found (Wr2) far from the limestone rim, and *B. pallida*, the best climber, was the only species collected at the driest station (Ps2), where it was buried quite deeply under rocks. Besides their difference in habits, these shells from Ps2 do average smaller and commonly their last whorls are less widely solute (some almost adnate) but the "differs" in riblets seem individual variation. Some are about the size of typical *beattyi* Clench, 1951:251, fig. 3, from Mona Island; one with all 17 whorls measures 10.3 mm. (over all) by 2.1 (not including aperture). Many more were found intact but even a little shaking rendered them decollate.

Pseudopineria viequensis (Pfeiffer). In holes and under overhang of cliffs, on or beneath the limestone outcrops of the northern rim, commonly in shaded places where *Brachypodella* was absent; Jn1, 2. Foot whitish; ommatophores translucent, cylindrical, with black eyes; inferior tentacles small but certainly present; sole unizonal, with 1 or 2 waves that involve its full width.

Macroceramus microdon (Pfeiffer). Pilsbry, 1903 (25a):115-116, pl. 24, figs. 71-72 (ANSP. 25117 & 25115, from R. Swift); van der Schalie, 1948:map 62, pl. 7, figs. 2a, 2b. En, Jn; growth threads narrower than their interspaces (much more so on subapical whorls) and irregularly spaced on later whorls.

The obsolete *M. johannis* Pfeiffer appears indistinguishable, and Aguadilla falls within the range of the typical subspecies.

M. microdon, var. *shuttleworthi* (Martens), 1877:352 (?), without exact locality. Pilsbry, fig. 74 (ANSP. 2572, from Bland); van der Schalie: fig. 2c. Ws: largest 18.7 mm. long with 12 whorls. Ps2: 1 adult 18.8 mm. long (decollate) and 2 immature, one of which approaches *loeryi* in growth threads.

M. microdon loeryi Jacobson, 1955. Ps2 (near type locality);

one adult and 1 immature, empty shells; look as if started life like var. a, but assumed later whorls of var. b, which see. Adult 14.1 mm. by 55 (7.7 mm.) with 7 whorls remaining.

M. microdon loeryi, var. a. Ps2, 3. Shells about size and form of typical *microdon*; one (Ps2) measures: 14.1 mm. by 36 (5.0 mm.) with 11.2 whorls; ranging to 17.2 mm. long with 12.6 whorls; without bluish tinge when alive; 1 shell unicolor, without white patches.

M. microdon loeryi, var. b. (?) *M. shuttleworthi* Martens, 1891: 132, Penuelas. Under bunch grass, but climbing 4 to 6 ft. during rain; near Tallaboa (Ps1). Shell with growth threads, especially on later whorls, broader than their interspaces and quite evenly and closely spaced; and those on subapical whorls less widely spaced than in typical *microdon*. Predominant color of shell light sky-blue on living examples but now (1960) almost completely faded to whitish (opaque) with narrow, light brownish (translucent) growth (axial) bands, as were empty shells found nearby (one of last unicolor, without whitish patches); with almost no trace of basal angulation in many; largest 21.1 by 37 (7.8 mm.), minor diam. 33 (6.9 mm.) with 13.2 whorls; smallest 19.8 mm. long with 11 whorls remaining. Living animal light slate color, darker near sole and on ommatophores; mantle collar dark brownish gray, with minute light spots; sole unizonal, with 1 or 2 locomotor waves across its full width.

In 1939, var. b. was considered a subspecies of *M. microdon* (Cf. van der Schalie:96) but I hesitated to name it because of the doubt about the true *M. shuttleworthi*, which Martens later located at the nearby Penuelas. The above presents the old notes, with a few changes; typical *loeryi* and var. a were included, as now.

Microceramus (s. s.) *guanicus* H. B. Baker. On rocks near ground; only known from type locality (Ps2) and Mona Island (Clench, 1951).

Bulimulus (s. s.) *guadalupensis* (Bruguère). On ground and tree trunks up to 5 ft., Ee, Es2 (coconut plantation), Es4, Jn1, Ps4 (garden), Ww1 (garden).

For this widely disseminated pest, van der Schalie, 1948:87, returned to *B. exilis* (Gmelin).

B. (s. s.) diaphanus (Pfeiffer). More terrestrial, Pn1, Pr2, 4, Ps2, 3, Wn, Ws; 0-3100 ft. Shell epidermis rufous (typical) to whitish.

This may be a native species, although described originally from St. Thomas. Pilsbry's, 1897 (9b):46-47, transference to this species of the Puerto Rican records of the now obsolete *B. fraterculus*

("Fér." Potiez & Michaud, 1838) is accepted; certainly nothing like the original (P. & M.) figures has been found since. The last name was nude in Férussac, 1821, livr. 11:54, and in Beck, 1837:67, although Beck questioningly (?) referred it to *Helix tenuissima* Férussac, 1832 (+ Orbigny, 1835?).

Drymaeus (Mesembrinus) virgulatus (Férussac, 1821) and color form (?) *liliaceus* (Fér., 1832). Arboreal, edges of Ps1 (30% *liliaceus*) and Ps2 (45% *liliaceus*); empty shells seen elsewhere but only near cultivated places.

The separation of these two lots into *liliaceus* (complete absence of brownish color) and *virgulatus* (with even a few streaks, up to axial and/or spiral bands of variable continuity) seems highly arbitrary. Confessedly, most of the "lilies" have a less elongate (Röding) form and a slightly swollen last whorl, but they include the most elongate¹ shell in the series, and typical *virgulatus* covers almost the entire range of shell form. These may be hybrids (of an introduced with a native form?) but they cast doubt on any specific separation, even if it has continued for 130 years.

D. (M.) multilincatus (Say); Cf. form *osmenti* Clench and/or *eboreus* Grimshawe. Along road to Wn. One shell from living adult resembling in form, texture and coloration those of Pilsbry, 1946 (11):27, figs. 15b, with similar columellar blotch (absent in thicker and chalkier *D. virgulatus*) and slightly wider, sutural stripe, but lacking all other dark bands except 4 (plus traces) axial streaks near aperture, and showing no signs of characteristic bluish color near apex. Another shell too broken and bleached to be sure of its form, with similar columellar patch and axial streaks, but without sutural stripe.

Neither fits the obsolete *Drymaeus hjalmarsoni* (Pfr.), from "near Manati" (between Jn and Pn), which, as Pilsbry (1899) suggested, seems to have been close to his (1946) *Leptodrymaeus*, and even might be the subsequently named *D. dormani* (W. G. Binney).

Simpulopsis (Eudioptus?) psidii (Martens, 1877). Not obtained.

From field notes, the young shells of *Platysuccinea* from the Cordillera Central, which approach it in height of spire, were confused with this arboreal species, and thus no special search

¹ More so than *beattyi* Clench, 1951: fig. 6, but less so than his type, figs. 4 & 5.

was made for it west of Utuado (between Wr6 and Pn1). However, a shell of the sagdid at the size of *S. psidii* (5 by 5 mm.) has one less whorl (2 vs. 3); being small, mature *S. psidii* might be found only near the end of a long rainy period. Pilsbry, 1902 (31):lxvii, included both *Eudioptus* Albers-Martens (not a homonym) and *Platysuccinea* in the bulimulid *Simpulopsis*, but no geophile systematist in this century has guessed either to be a "*Bulimulus*." The type species of *Eudioptus*, in which Martens placed his "*Bulimus*" *psidii*, is Brazilian, but a dweller on guava leaves might be carried by commerce.

Gaeotis nigrolineata Shuttleworth. Mainly on leaves of palms, but also on those of *Cecropia* and other trees, Er3, 4, 5; in axils of palm pinnae, Wr3; from Luquillo Mts. to western end of the Cordillera Central; 2000-3000 ft. Living animal (Er) 3 by 1½ inches (76 by 38 mm.); yellowish green, but variable; dorsum of foot slaty with yellow middorsal stripe (*flavolineata*) which often becomes double anteriad; and often with frosty, whitish patches (like *albopunctulata*?); sides and inferior tentacles lighter, but sole often with orange margin on anterior ⅓ (*flavolineata*); ommatophores blue green, but eyes lighter; mantle (over shell) pea green; often with (internal) black streaks visible (*nigrolineata*).

Very flimsy shell "sigaretiform" but thin lower surface of apical whorls present and containing those of animal, so that separation in preserved examples means damage to one or the other (shells still on most of mine). Lower surface of apical whorls broken away from all 6 shells studied by Pilsbry, 1899 (35):227-231, as follows: ANSP. 4613, one labeled "*albopunctulata*" and one (4614) "*nigrolineata*" from Humacao (Bland). ANSP. 26052, type lot of *malleata*; 2 shells from "near San Juan," from Swift, collected in 1855. ANSP. 4959, one juvenile labeled "*flavolineata*" by Bland (not by Pilsbry) from "Luquillo." ANSP. 26051, labeled "*nigrolineata*" from "Pto. Rico" (Swift).

G. nigrolineata is the type species of *Gaeotis*, by subsequent designation of Kobelt, 1880, Ill. Conch.:264. Although only preliminary dissections have been made as yet, all my material looks like one variable species, but none of it comes from the lowlands (secretive during dry weather?). On El Yunque, this bulimulid slug was fairly common, but its coloration blends with the leaves.

ADDITIONAL REFERENCES (See 1961)

- 1961 (1), Naut. 74:142. 1961 (5), Naut. 75:64.
Aguayo, Carlos G. 1961, Caribb. J. Sci. 1:89-106.
Jacobson, Morris. 1955, Archiv f. Molluskenk. 87:97-99.